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Anand Prahlad

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EXAMINER

RUTZ, JARED IAN

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/681,386

Applicant(s)

PRAHLAD ET AL.

Examiner

Jared I. Rutz

Art Unit

2187

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 11-13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 14-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-22, as amended on 9/17/2007, are pending in the instant application. Claims 11-13 have been withdrawn. Accordingly, claims 1-10 and 14-22 have received examination in the instant Office action. Applicant's arguments submitted 9/17/2007 have been carefully and fully considered, but are not found persuasive. Accordingly, the instant Office action has been made **FINAL**.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. **Claims 14-15 and 17** are rejected under 35 U.S.C. 102(e) as being anticipated by St. Pierre at al. (US 6,366,986).
4. **Claim 14** is taught by St. Pierre as:
 - a. *A method for periodically copying changing data on a primary volume, the method comprising: capturing a first snapshot of data in a primary volume in accordance with a predefined policy. Column 16 lines 23-65 discuss taking differential backups of data that has changed since the last level zero backup or*

differential backup. Column 22 lines 34-37 show that a differential backup can be used to restore a volume to its state at the time the differential backup was taken, and accordingly provides a logical point in time copy of the primary volume.

b. *The first snapshot being a block level copy of the data in the primary volume.* Column 17 lines 10-15 show that the changed data segments are backed up in a differential bit file. As discussed at column 16 lines 32-40, the changed data segments may be tracked at the block level.

c. *And the policy comprising one or more parameters for creating a quick recovery volume.* Column 16 lines 60-65 show that a DD-TAB file containing the logical bit mask is created. Column 17 lines 40-65 discusses how the logical bit mask can be used to create a differential bit map, which is shown in column 18 lines 35-39 to be used to create a synthetic level zero backup, which is a regenerated copy of the complete logical element (column 18 lines 10-21).

d. *Storing the first snapshot.* Column 13 lines 20-25 show that space is allocated on the backup storage system to receive the information to be backed up. Column 17 lines 10-17 show that the differential bit file is backed up to the backup storage system 54.

e. *In accordance with at least a second criteria specified in the policy, monitoring for a change in any one of the blocks stored in the first snapshot.* Column 10 lines 41-47 shows that segments that contain changed data are tracked.

- f. *And storing a copy of a particular block when the monitoring determines that there was a change in the particular block from the first snapshot. Column 17 lines 10-17 show that the differential bit file is backed up to the backup storage system 54.*
 - g. *Selecting the first snapshot for copying to a corresponding quick recovery volume. Column 19 lines 3-5 shows that synthetic level zero backups may be generated when the differential backup is performed or later.*
 - h. *And performing a block-level copy of the selected snapshot to the corresponding quick recovery volume. Column 18 lines 10-15 shows that a level zero backup is a regenerated copy of the complete logical element.*
- 5. **Claim 15** is taught by St. Pierre as:
 - i. *The method as recited in claim 14, further comprising: producing a copy of the primary volume using the first snapshot and any copies of blocks that changed after the first snapshot, after at least one block has changed since the first snapshot. Column 18 line 34 through column 19 line 13 discusses figure 18, which explains how a copy of the backed up primary volume is created using a level zero backup and a series of differential backups.*
- 6. **Claim 17** is taught by St. Pierre as:
 - j. *A method of managing stored data in a storage management system, the storage management system including a storage manager, a media agent*

connected to the storage manager, and a primary volume connected to the media agent, the method comprising: taking a first snapshot of the primary volume in accordance with a predefined policy. Column 16 lines 23-65 discuss taking differential backups of data that has changed since the last level zero backup or differential backup. Column 22 lines 34-37 show that a differential backup can be used to restore a volume to its state at the time the differential backup was taken, and accordingly provides a logical point in time copy of the primary volume.

k. *The policy comprising one or more parameters for creating a quick recovery volume.* Column 16 lines 60-65 show that a DD-TAB file containing the logical bit mask is created. Column 17 lines 40-65 discusses how the logical bit mask can be used to create a differential bit map, which is shown in column 18 lines 35-39 to be used to create a synthetic level zero backup, which is a regenerated copy of the complete logical element (column 18 lines 10-21).

l. *Identifying characteristics associated with the first snapshot and storing the characteristics in an index.* Column 12 lines 21-25 show that the physical storage segments corresponding to the to the data to be backed up are identified and stored in the DD-TAB.

m. *Selecting the first snapshot for copying to a corresponding quick recovery volume.* Column 19 lines 3-5 shows that synthetic level zero backups may be generated when the differential backup is performed or later.

n. *And performing a block-level copy of the selected snapshot to the corresponding quick recovery volume.* Column 18 lines 10-15 shows that a level zero backup is a regenerated copy of the complete logical element.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. **Claims 1, 10, 16, and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over St. Pierre et al. (cited supra) in view of the Examiner's taking of OFFICIAL NOTICE.

9. **Claim 1** is taught by St. Pierre as:

o. *A method of managing stored data in a storage management system, the storage management system including a storage manager.* Backup storage system 54 of figure 6.

p. *A media agent connected to the storage manager.* Logical volume manager 14.

q. *And a primary volume connected to the media agent.* Column 2 lines 49-54 shows that the logical volume manager maps volumes A, B, and C onto the physical storage system.

r. *The method comprising: taking a first snapshot of the primary volume in accordance with a predefined policy.* Column 16 lines 23-65 discuss taking differential backups of data that has changed since the last level zero backup or differential backup. Column 22 lines 34-37 show that a differential backup can be used to restore a volume to its state at the time the differential backup was taken, and accordingly provides a logical point in time copy of the primary volume.

s. *The policy comprising one or more parameters for creating a quick recovery volume.* Column 16 lines 60-65 show that a DD-TAB file containing the logical bit mask is created. Column 17 lines 40-65 discusses how the logical bit mask can be used to create a differential bit map, which is shown in column 18 lines 35-39 to be used to create a synthetic level zero backup, which is a regenerated copy of the complete logical element (column 18 lines 10-21).

t. *Indexing the first snapshot by associating respective information with the snapshot.* Column 13 lines 7-19 show that the DD-TAB file can later be used to restore a backed up volume.

u. *Taking a second snapshot, in accordance with the predefined policy.* Column 17 lines 21-27 discusses the processing necessary to prepare for taking additional differential backups. Figure 17 shows an example having a full level zero backup, item 174, and three differential backups, items 171-173.

v. *Selecting the first or second snapshot for copying to a corresponding quick recovery volume.* Column 19 lines 3-5 shows that synthetic level zero backups may be generated when the differential backup is performed or later.

10. St. Pierre does not explicitly teach that the differential backup is deleted after a corresponding synthetic level zero backup is performed.

11. However, the Examiner takes OFFICIAL NOTICE to the fact that once a synthetic level zero backup has been generated for a differential backup, the data contained in the differential backup is no longer needed, as the synthetic level zero backup contains the complete state of the volume at the time the differential backup was taken.

12. At the time of the invention it would have been obvious to one of ordinary skill in the art to delete the differential backup after generating a synthetic level zero backup.

13. The motivation for doing so would have been to free up the space taken up by the differential bit file and the differential bit map of the no longer needed differential backup.

14. Therefore, it would have been obvious to delete a differential backup after generating the synthetic level zero backup from the differential backup for the benefit of saving space to obtain the invention as specified in claim 1.

15. **Claim 10** is taught by St. Pierre as:

- w. *A computer readable medium including computer executable code for managing stored data in a storage management system.* Column 12 lines 43-45 shows that the steps disclosed may be performed by software.
- x. *The storage management system including a storage manager.* Backup storage system 54 of figure 6.
- y. *A media agent connected to the storage manager.* Logical volume manager 14.
- z. *And a primary volume connected to the media agent.* Column 2 lines 49-54 shows that the logical volume manager maps volumes A, B, and C onto the physical storage system.
- aa. *The code enabling the steps of: taking a first snapshot of the primary volume in accordance with a predefined policy.* Column 16 lines 23-65 discuss taking differential backups of data that has changed since the last level zero backup or differential backup. Column 22 lines 34-37 show that a differential backup can be used to restore a volume to its state at the time the differential backup was taken, and accordingly provides a logical point in time copy of the primary volume.
- bb. *The policy comprising one or more parameters for creating a corresponding quick recovery volume.* Column 16 lines 60-65 show that a DD-TAB file containing the logical bit mask is created. Column 17 lines 40-65 discusses how the logical bit mask can be used to create a differential bit map, which is shown in column 18 lines 35-39 to be used to create a synthetic level

zero backup, which is a regenerated copy of the complete logical element (column 18 lines 10-21).

cc. *Indexing the first snapshot by associating respective information with the snapshot.* Column 13 lines 7-19 show that the DD-TAB file can later be used to restore a backed up volume.

dd. *Taking a second snapshot, in accordance with the predefined policy.* Column 17 lines 21-27 discusses the processing necessary to prepare for taking additional differential backups. Figure 17 shows an example having a full level zero backup, item 174, and three differential backups, items 171-173.

ee. *Selecting the first or second snapshot for copying to a corresponding quick recovery volume.* Column 19 lines 3-5 shows that synthetic level zero backups may be generated when the differential backup is performed or later.

ff. *Performing a block-level copy of the selected snapshot to the corresponding quick recovery volume.* Column 18 lines 10-15 shows that a level zero backup is a regenerated copy of the complete logical element.

16. St. Pierre does not explicitly teach that the differential backup is deleted after a corresponding synthetic level zero backup is performed.

17. However, the Examiner again draws Applicant's attention to the fact that once a synthetic level zero backup has been generated for a differential backup, the data contained in the differential backup is no longer needed, as the synthetic level zero backup contains the complete state of the volume at the time the differential backup was taken.

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18. At the time of the invention it would have been obvious to one of ordinary skill in the art to delete the differential backup after generating a synthetic level zero backup.

19. The motivation for doing so would have been to free up the space taken up by the differential bit file and the differential bit map of the no longer needed differential backup.

20. Therefore, it would have been obvious to delete a differential backup after generating the synthetic level zero backup from the differential backup for the benefit of saving space to obtain the invention as specified in claim 10.

21. **Claim 16** is taught by St. Pierre as:

gg. *A method for producing a copy of a primary volume, comprising: capturing a first snapshot of data in a primary volume in accordance with a predefined policy.* Column 16 lines 23-65 discuss taking differential backups of data that has changed since the last level zero backup or differential backup. Column 22 lines 34-37 show that a differential backup can be used to restore a volume to its state at the time the differential backup was taken, and accordingly provides a logical point in time copy of the primary volume.

hh. *The first snapshot being a block level copy of the data in the primary volume.* . Column 17 lines 10-15 show that the changed data segments are backed up in a differential bit file. As discussed at column 16 lines 32-40, the changed data segments may be tracked at the block level.

ii. *And the policy comprising one or more parameters for creating a quick recovery volume.* Column 16 lines 60-65 show that a DD-TAB file containing the logical bit mask is created. Column 17 lines 40-65 discusses how the logical bit mask can be used to create a differential bit map, which is shown in column 18 lines 35-39 to be used to create a synthetic level zero backup, which is a regenerated copy of the complete logical element (column 18 lines 10-21).

jj. *Storing the first snapshot.* Column 13 lines 20-25 show that space is allocated on the backup storage system to receive the information to be backed up. Column 17 lines 10-17 show that the differential bit file is backed up to the backup storage system 54.

kk. *In accordance with at least a second criteria specified in the policy, monitoring for a change in any one of the blocks stored in the first snapshot.* Column 10 lines 41-47 shows that segments that contain changed data are tracked.

ll. *Storing a copy of a particular block when the monitoring determines that there was a change in the particular block from the first snapshot.* Column 17 lines 10-17 show that the differential bit file is backed up to the backup storage system 54.

mm. *Producing a copy of the primary volume using the first snapshot and any copies of blocks that changed after the first snapshot, after at least one block has changed since the first snapshot.* Column 18 line 34 through column 19 line 13

discusses figure 18, which explains how a copy of the backed up primary volume is created using a level zero backup and a series of differential backups.

nn. *Selecting the first snapshot for copying to a corresponding quick recovery volume.* Column 19 lines 3-5 shows that synthetic level zero backups may be generated when the differential backup is performed or later.

oo. *Performing a block-level copy of the selected snapshot to the corresponding quick recovery volume.* Column 18 lines 10-15 shows that a level zero backup is a regenerated copy of the complete logical element.

22. St. Pierre does not explicitly teach that the differential backup is deleted after a corresponding synthetic level zero backup is performed.

23. However, the Examiner again draws Applicant's attention to the fact that once a synthetic level zero backup has been generated for a differential backup, the data contained in the differential backup is no longer needed, as the synthetic level zero backup contains the complete state of the volume at the time the differential backup was taken.

24. At the time of the invention it would have been obvious to one of ordinary skill in the art to delete the differential backup after generating a synthetic level zero backup.

25. The motivation for doing so would have been to free up the space taken up by the differential bit file and the differential bit map of the no longer needed differential backup.

26. Therefore, it would have been obvious to delete a differential backup after generating the synthetic level zero backup from the differential backup for the benefit of saving space to obtain the invention as specified in claim 16.

27. **Claim 18** is taught by St. Pierre as:

pp. *The method of managing stored data in a storage management system of claim 1, wherein the one or more parameters for creating a quick recovery volume comprise a destination volume parameter of the quick recovery volume.*

Column 13 lines 7-19 show that the backup storage system's DD-TAB indicates where the backed up data is stored on the backup storage system.

28. **Claims 2-4, 7-8, and 21-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over St. Pierre et al. (cited supra) in view of the Examiner's taking of OFFICIAL NOTICE as applied to claims 1, 10, 16, and 18 above, and further in view of Dunphy et al. (US 5,638,509).

29. **Claim 2** is taught by St. Pierre as shown supra with respect to claim 1.

30. St Pierre does not expressly disclose displaying the snapshots to a user.

31. With respect to claim 2, Dunphy teaches:

qq. *Displaying the snapshots to a user.* Figure 4 of Dunphy shows a graphical display of a data file restore process. As discussed in column 6 lines 16-21, items 42 and 43 represent a timewise progression of data file 41.

32. St. Pierre and Dunphy are analogous art because they are from the same field of endeavor, the design of data storage systems.

33. At the time of the invention it would have been obvious to use the graphical display of Dunphy to manage the backup volumes of St. Pierre.

34. The motivation for doing so would have been that such a system is simple to use, Dunphy column 2 lines 48-51.

35. Therefore, it would have been obvious to combine Dunphy with St. Pierre for the benefit of simple management of backup volumes to obtain the invention as specified in claims 2-4 and 7-8.

36. **Claim 3** is taught by Dunphy as:

rr. *The method as recited in claim 2, wherein the displaying further includes displaying at least one of a respective date of creation of each snapshot, a respective persistence of each snapshot, and a respective location of each snapshot.* Column 8 lines 49-58.

37. **Claim 4** is taught by Dunphy as:

ss. *The method as recited in claim 2, wherein the displaying further includes displaying the snapshots to the user in a hierarchical format.* Column 8 lines 58-61.

38. **Claim 7** is taught by Dunphy as:

tt. *The method as recited in claim 4, further comprising: enabling the user to select at least one of the snapshots for restoration.* Column 8 lines 34-39.

uu. *And restoring the at least one snapshot selected by the user.* Column 9 lines 17-58.

39. **Claim 8** is taught by Dunphy as:

vv. *The method as recited in claim 2, further comprising enabling the user to delete a selected one of the snapshots.* Column 8 lines 52-61.

40. **Claim 21** is taught by St. Pierre as:

ww. *A method of managing stored data in a storage management system, the storage management system including a storage manager.* Backup storage system 54 of figure 6.

xx. *A media agent connected to the storage manager.* Logical volume manager 14.

yy. *And a primary volume connected to the media agent.* Column 2 lines 49-54 shows that the logical volume manager maps volumes A, B, and C onto the physical storage system.

zz. *The method comprising: taking a first snapshot of the primary volume in accordance with a predefined policy.* Column 16 lines 23-65 discuss taking differential backups of data that has changed since the last level zero backup or differential backup. Column 22 lines 34-37 show that a differential backup can

be used to restore a volume to its state at the time the differential backup was taken, and accordingly provides a logical point in time copy of the primary volume.

aaa. *The policy comprising one or more parameters for creating a corresponding quick recovery volume.* Column 16 lines 60-65 show that a DD-TAB file containing the logical bit mask is created. Column 17 lines 40-65 discusses how the logical bit mask can be used to create a differential bit map, which is shown in column 18 lines 35-39 to be used to create a synthetic level zero backup, which is a regenerated copy of the complete logical element (column 18 lines 10-21).

bbb. *Indexing the first snapshot by associating respective information with the snapshot.* Column 13 lines 7-19 show that the DD-TAB file can later be used to restore a backed up volume.

ccc. *Taking a second snapshot, in accordance with the predefined policy.* Column 17 lines 21-27 discusses the processing necessary to prepare for taking additional differential backups. Figure 17 shows an example having a full level zero backup, item 174, and three differential backups, items 171-173.

ddd. *And recovering portions of data at the selected level and any level below the selected level.* Column 21 line 41 through column 22 line 33 discusses, with respect to figure 17, restoring the primary volume to the state at time T-2. Column 21 line 44 through column 22 line 22 shows that to restore to time T-2, the differential backup at time T-3 and the level zero backup at time T4 are used.

41. St. Pierre does not expressly teach using a user interface to display the snapshots and allowing a user to select a level.

42. With respect to claim 22, Dunphy teaches:

eee. *Displaying a user interface comprising levels of available snapshots and quick recovery volumes.* Column 6 lines 15-25, discussing figure 4, teach using a user interface to display a plurality of versions of a backed up file, items 41-45 of figure 4.

fff. *Receiving from a user a selection of a displayed level.* Column 6 lines 21-25 shows that the various versions are shown so a user can identify a particular version to be restored.

43. St. Pierre and Dunphy are analogous art because they are from the same field of endeavor, the design of data storage systems.

44. At the time of the invention it would have been obvious to use the graphical display of Dunphy to manage the backup volumes of St. Pierre.

45. The motivation for doing so would have been that such a system is simple to use, Dunphy column 2 lines 48-51.

46. Therefore, it would have been obvious to combine Dunphy with St. Pierre for the benefit of simple management of backup volumes to obtain the invention as specified in claims 21-22.

47. **Claim 22** is taught by Dunphy as:

ggg. *The method of claim 21, wherein the displayed user interface comprises multiple hierarchical levels of available snapshots and quick recovery volumes.*

Figure 4 items 41-45, as discussed in column 6 lines 15-25, shows a plurality of versions of the data file displayed hierarchically.

48. **Claims 5-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over St. Pierre et al. (cited supra) in view of the Examiner's taking of OFFICIAL NOTICE as applied to claims 1, 10, 16, and 18 above, and further in view of De Meno et al. (2001/0029517).

49. **Claim 5** is taught by St. Pierre as shown supra with respect to claim 1.

50. St. Pierre further teaches that snapshots can be made based on files needed by an application, see column 11 lines 60-67, but does not expressly disclose that the snapshots are associated with a corresponding application.

51. With respect to claim 5, De Meno teaches:

hhh. *Associating each respective snapshot with a corresponding application.*

Paragraph 0008 shows the use of an application specific rollback system.

52. St. Pierre and De Meno are analogous art because they are from the same field of endeavor, the design of data backup systems.

53. At the time of the invention it would have been obvious to one of ordinary skill in the art to associate the level zero backups of St. Pierre with their corresponding application as taught by De Meno.

54. The motivation for doing so would have been that allowing application specific rollback allows a user to access a specific version of data needed by an application, De Meno paragraph 0008. Further, allowing application specific recovery lessens the likelihood that a large amount of unrelated data needs to be restored, leading to faster restoration.

55. Therefore, it would have been obvious to one of ordinary skill in the art to combine De Meno with St. Pierre to obtain the invention as specified in claims 5-6.

56. **Claim 6** is taught by De Meno as:

iii. *The method as recited in claim 5, further comprising displaying to a user a respective one of the snapshots in a screen corresponding to the respective application.* Paragraph 0033 discusses showing a user a window of available backups, as shown in figure 4.

57. **Claims 9 and 19-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over St. Pierre et al. (cited supra) in view of the Examiner's taking of OFFICIAL NOTICE as applied to claims 1, 10, 16, and 18 above, and further in view of Midgely et al. (US 5,604,862).

58. **Claim 9** is taught by St. Pierre as shown supra with respect to claim 1.

59. St. Pierre does not expressly disclose deleting snapshots after a defined period of time.

60. With respect to claim 9, Midgely teaches

jjj. *Deleting a snapshot after a defined period of time.* Column 7 lines 18-21 shows that a redundant version of a file is not required to be stored in disk cache 120, and can be erased.

61. St. Pierre and Midgely are analogous art because they are from the same field of endeavor, the design of data storage systems.

62. At the time of the invention, it would have been obvious to one of ordinary skill in the art to delete a snapshot after a defined period of time.

63. The motivation for doing so would have been to maintain space in the disk cache for newer versions of copies, Midgely column 7 lines 14-15.

64. Therefore, it would have been obvious to one of ordinary skill in the art to combine Midgely with St. Pierre for the benefit of maintaining space in the backup storage system to obtain the invention as specified in claims 9, 19, and 20.

65. **Claim 19** is taught by Midgely as:

kkk. *The method of managing stored data in a storage management system of claim 1, wherein the one or more parameters for creating a quick recovery volume comprise a persistence parameter provided in the policy.* Column 6 line 65 through column 7 show that the newest version of a copy is always available in the cache or on one of the tapes of the autoloader. Accordingly, policy comprising a persistence parameter is that the most recent copy persists in the faster storage.

66. **Claim 20** is taught by Midgely as:

III. *The method of managing stored data in a storage management system of claim 1, wherein the one or more parameters for creating a quick recovery volume comprise a data pruning parameter provided in the policy.* Column 7 lines 2-6 show that versions of the most actively used files on the disk cache are maintained. Accordingly, policy comprising a data pruning parameter is that less actively used copies are pruned from the disk cache to make room for more actively used copies.

Response to Arguments

67. Applicant's arguments filed 9/17/2007 have been fully considered but they are not fully persuasive.

68. **First point of Argument**

69. In the second paragraph beginning on page 8 of the remarks submitted 9/17/2007, with respect to the Objection to claims 19 and 20, Applicant's amendments to claims 19 and 20 are sufficient to overcome the Examiner's Objection to these claims. Accordingly, the Objection to claims 19 and 20 is withdrawn.

70. **Second point of Argument**

71. In the second paragraph beginning on page 8 of the remarks submitted 9/17/2007, with respect to the rejection of claim 16 under 35 USC 101, Applicant's

amendments to claim 16 are sufficient to overcome said rejection. Accordingly, the rejection of claim 16 under 35 USC 101 is withdrawn.

72. Third point of Argument

73. In the second paragraph beginning on page 9 and continuing on page 10, with respect to St. Pierre's teachings of snapshots and a quick recovery volume, Applicant argues:

mmm. "The primary reference relied upon, St. Pierre, fails to show many elements of the claims. St. Pierre is directed to a basic incremental backup system. According to St. Pierre, a "level zero" backup is performed first. A level zero backup is a complete backup of a logical construct, such as an entire file or an entire partition. Later, only the data segments that have been changed are backed up. Thus, St. Pierre only discloses creating a single backup and updating that backup as changes are made to the primary data set. The teachings of St. Pierre are well known and are not particularly related to the claimed invention. For instance, St. Pierre does not show snapshot images or any other intermediate copies that would correspond to the snapshots of the claims. Rather, St. Pierre shows multiple differential backups including only the primary copy data elements that have been changed. Snapshots, however, are not limited to only data that has been changed. Furthermore, St. Pierre does not disclose a "quick recovery volume." As described in the application at least in para. [00034], a quick recovery volume is a full replica of data that can be mounted and pointed to be used in place of the original volume. For at least

these reasons, Applicants respectfully submit that St. Pierre does not anticipate the pending claims."

74. The Examiner respectfully disagrees. The Examiner respectfully submits that Applicant has mischaracterized St. Pierre in saying that St. Pierre only teaches creating a single backup and updating that backup as changes are made to the primary set. As shown in figure 17, St Pierre teaches not only a level zero backup and differential backups, but that the differential backups can be stored and used to restore the primary volume to its state at the time the differential backup was performed, see for example figure 21 and the discussions of figures 17 and 18 at column 21 line 5 through column 23 line 17. As each differential backup can be used to restore the primary volume to its state at a corresponding point in time, the examiner respectfully submits that each differential backup provides a snapshot as the term is commonly used in the art. As support for this interpretation, the Examiner has cited Kusters et al. (US 6,651,075) on the included PTO-892 form. The Examiner wishes to specifically point out the discussion of "snapshot" in column 1 lines 13-42.

75. With respect to St. Pierre's teaching of a "*quick recovery volume*" as recited in the claims, the Examiner respectfully notes that St. Pierre teaches, at column 18 line 10 through column 19 line 44 and elsewhere, the creation of a "synthetic level zero backup". Column 18 lines 13-15 shows that a synthetic level zero backup is a regenerated copy of the complete logical element, and column 19 lines 42-44 shows that a synthetic level zero backup may be copied to the primary system copy of the logical element. The Examiner respectfully submits that these sections of St. Pierre

show that a synthetic level zero backup is *“a full replica of data that can be mounted and pointed to be used in place of the original volume”* and accordingly teaches the recited *“quick recovery volume”*.

76. Fourth point of Argument

77. In the first paragraph beginning on page 10, with respect to the rejection of claims 2-4 and 7-8 under 35 USC 103(a) as being unpatentable over St. Pierre in view of Dunphy, applicant argues that the systems and methods of Dunphy are unrelated to the claimed invention. The Examiner respectfully disagrees, and submits that Dunphy's teaching of a GUI for managing the restoration of temporal states of logical elements is relevant to the claimed invention for at least the reasons shown supra with respect to claims 2-4, 7-8, and 21-22.

78. Fifth point of Argument

79. In the second paragraph beginning on page 10, with respect to the rejection of claims 5-6 under 35 USC 103(a) as being unpatentable over St. Pierre in view of De Meno, applicant argues that the systems and methods of De Meno are unrelated to the claimed invention. The Examiner respectfully disagrees, and submits that De Meno's teaching of application specific rollback is relevant to the claimed invention for at least the reasons shown supra with respect to claims 5-6.

80. Sixth point of Argument

81. In the third paragraph beginning on page 10 and continuing on page 11, with respect to the rejection of claims 9 and 19-20 under 35 USC 103(a) as being unpatentable over St. Pierre in view of Midgley, applicant argues that the systems and

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methods of Midgley are unrelated to the claimed invention. The Examiner respectfully disagrees, and submits that Midgley's teaching of deleting redundant data stored in a backup system is relevant to the claimed inventions for at least the reasons sown supra with respect to claims 9 and 19-20.

Conclusion

82. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

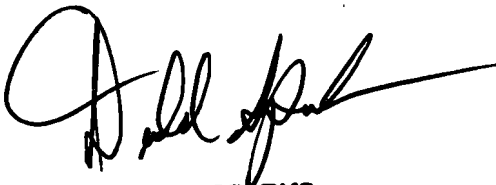
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jared I. Rutz whose telephone number is (571) 272-5535. The examiner can normally be reached on M-F 8:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald Sparks can be reached on (571) 272-4201. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jared I Rutz
Examiner
Art Unit 2187

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